Exhibit D

Jeffrey Lubin

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PROFESSIONAL SUMMARY

More than 30 years' experience leading initiatives and developing intellectual property in advanced image, video, and human behavioral analysis R&D initiatives for both government and commercial clients.

HIGHLIGHTS

- PhD, University of Pennsylvania; Dissertation: Modeling of Motion Perception in Human Vision; Cattell Award honoree for best dissertation in Psychology
- BA with Honors, Swarthmore College; Senior Thesis: Pattern recognition mechanisms in human vision
- Senior Research Scientist at SRI International Sarnoff, attracting and managing several million dollars in annual revenue from US Government and commercial sources, and managing cross-company and cross-disciplinary teams
- Over 30 issued patents and a dozen publications
- Pioneer in areas including motion-estimation-based tweening, multi-frame image and video enhancement, multi-frame and multi-camera 3D object recovery, video image quality analysis, temporal behavior-based biometrics and biometric spoof detection, cinema watermarking, video tamper detection, and realistic video rendering of human faces and voices through machine learning techniques.
- Technical Emmy for development of system for automatic estimation of motion picture and television image quality
- Sarnoff Technical Achievement Award for development of a computational model of human visual spatiotemporal performance
- Development of world's only digital cinema watermark that is invisible to Hollywood "golden eyes" but robust to extreme degradation
- Development of robust techniques for biometric spoof detection using analysis of detailed skin dynamics
- Development of remote measurement and experimental techniques for human stress resilience measurement and training

- Development of robust techniques for realistic human face and voice rendering using machine learning
- Motion-sensor-based techniques for fall risk estimation in the elderly
- Development of machine vision algorithms for robotic manufacturing inspection in early startup in the field (Automatix, Inc.)

EXPERIENCE

Systems Engineer
Automatix, Inc. – Billerica, MA
1983 – 1984

Post-Doc
David Sarnoff Research Center – Princeton, NJ
1986 – 1987

Member of Technical Staff
David Sarnoff Research Center – Princeton, NJ
1986 – 1987

Member of Technical Staff
Sarnoff Corporation – Princeton, NJ
1988 – 1996

Senior Member of Technical Staff
Sarnoff Corporation – Princeton, NJ
1996 – 2011

Senior Research Scientist
SRI International Sarnoff – Princeton, NJ
2011 – present

EDUCATION

PhD in Psychology, University of Pennsylvania, 1992.
BA in Psychology, Swarthmore College, 1981

AWARDS

- Winner of Technical Emmy for pioneering development of video picture quality measurement system
- Recipient of the Sarnoff Technical Achievement Award "for development of a computational model of human visual spatiotemporal performance"

SELECTED PATENTS AND PUBLICATIONS

- US US5260791A: Method and apparatus for the spatio-temporal coring of images
- WO US US5694491A: Methods and apparatus for assessing the visibility of differences between two image sequences
- WO US US5719966A: Apparatus for assessing the visiblity of differences between two image sequences
- US US6075884A: Method and apparatus for training a neural network to learn and use fidelity metric as a control mechanism
- WO EP US JP KR DE US5974159A: Method and apparatus for assessing the visibility of differences between two image sequences
- WO EP US JP US5909516A: Method and apparatus for decomposing an image stream into units of local contrast
- WO EP US CN JP BR CA US6137904A: Method and apparatus for assessing the visibility of differences between two image sequences
- WO EP US JP CA US6269175B1: Method and apparatus for enhancing regions of aligned images using flow estimation
- CA CA2463162C: Method and apparatus for processing images
- US US6360022B1: Method and apparatus for assessing the visibility of differences between two image sequences
- DE DE60043577D1: Method and apparatus for assessing the visibility of differences between two signal sequences
- WO EP JP EP1157354B1: Method and apparatus for assessing the visibility of differences between two signal sequences
- WO EP US JP KR DE US6285797B1: Method and apparatus for estimating digital video quality without using a reference
- EP US JP US7298865B2: Secure robust high-fidelity watermarking
- WO US US7756288B2: Method and apparatus for analog insertion of low frequency watermarks
- WO US US7418110B2: Method and apparatus for compressed-domain watermarking
- WO US US7769199B2: Method and apparatus for providing reduced reference techniques for low frequency watermarking
- WO US US7295681B2: Method and apparatus for providing improved workflow for digital watermarking
- WO US US8320729B2: Camcorder jamming techniques using high frame rate displays
- US US8498487B2: Content-based matching of videos using local spatio-temporal fingerprints
- US US8189858B2: Digital watermarking with spatiotemporal masking
- US US8439683B2: Food recognition using visual analysis and speech recognition
- US US9734730B2: Multi-modal modeling of temporal interaction sequences
- J. Lubin, J. Bergen, and G. Kovacs, "Physiological Dynamics-Based Detection of Liveness, Spoofing, or Presentation Attacks" Provisional Patent # SRI-US-170028-2P, filed March 21, 2017.

- J. Lubin, 1989 Discrimination contours in an opponent motion stimulus space. Investigative Ophthalmology and Visual Science Supplement, 30, 426.
- J. Lubin and J. Nachmias, 1991 Discrimination contours in an f/3f stimulus space. Investigative Ophthalmology and Visual Science Supplement, 31, 409.
- J. Lubin, A.P. Pica, 1991. A nonuniform quantizer matched to human visual performance, Proc. SID, 619-622.
- J. Lubin, Interactions among motion-sensitive mechanisms in human vision, Unpublished doctoral dissertation, University of Pennsylvania, 1992.
- J. Lubin, 1993. The use of psychophysical data and models in the analysis of display system performance, in Digital Images and Human Vision, ed. Watson, A.B. (MIT Press, Cambridge, MA), pp. 163-178.
- J. Lubin and J. R. Bergen, 1993, "Cockpit display visibility modeling," NASA Contractor Report 177623 (NASA/Ames Research Center, Moffet Field, CA, 1993).
- W.B. Jackson, P. Beebee, D.A. Jared, D. Beigelsen, J.O. Larimer, J. Lubin, and J. Gille, 1996, X-ray image system design using a human visual model, Proc. SPIE Vol. 2708, 29-40.
- W.B. Jackson, M.R. Said, D.A. Jared, J.O. Larimer, J. Gille, J. Lubin, 1997. Evaluation of human visual models for predicting human-observer performance. Proc SPIE Medical Imaging; 3036: 64-73.
- J.P. Johnson, J. Lubin, E.A. Krupinski, H.A. Peterson, H. Roehrig, and A. Baysinger, Visual discrimination model for digital mammography. SPIE Medical Imaging 1999; 3663: 253-263.
- M. H. Brill, J. Lubin, D. Wolin, "Single visual-quality metric for hardcopy image evaluation," Proc. IS&T's NIP15: International Conference on Digital Printing Technologies, October 17-22, 1999.
- M. H. Brill, J. Lubin, P. Costa, S. Wolf, J. Pearson, "Accuracy and cross-calibration of video-quality metrics: new methods from ATIS/T1A1," Proc. ICIP 2002, Rochester, NY.